



Pilot Projects on Networked Resources Conference on Communication and Control Systems for Distributed Energy

***Skamania Lodge
October 24-25
Stevenson, WA***

Joseph G. Fiorito CEM CEP

Distributed Power Marketing Manager

Agenda

- **Background**
- **Available Technologies**
- **Case Studies**
- **Summary**

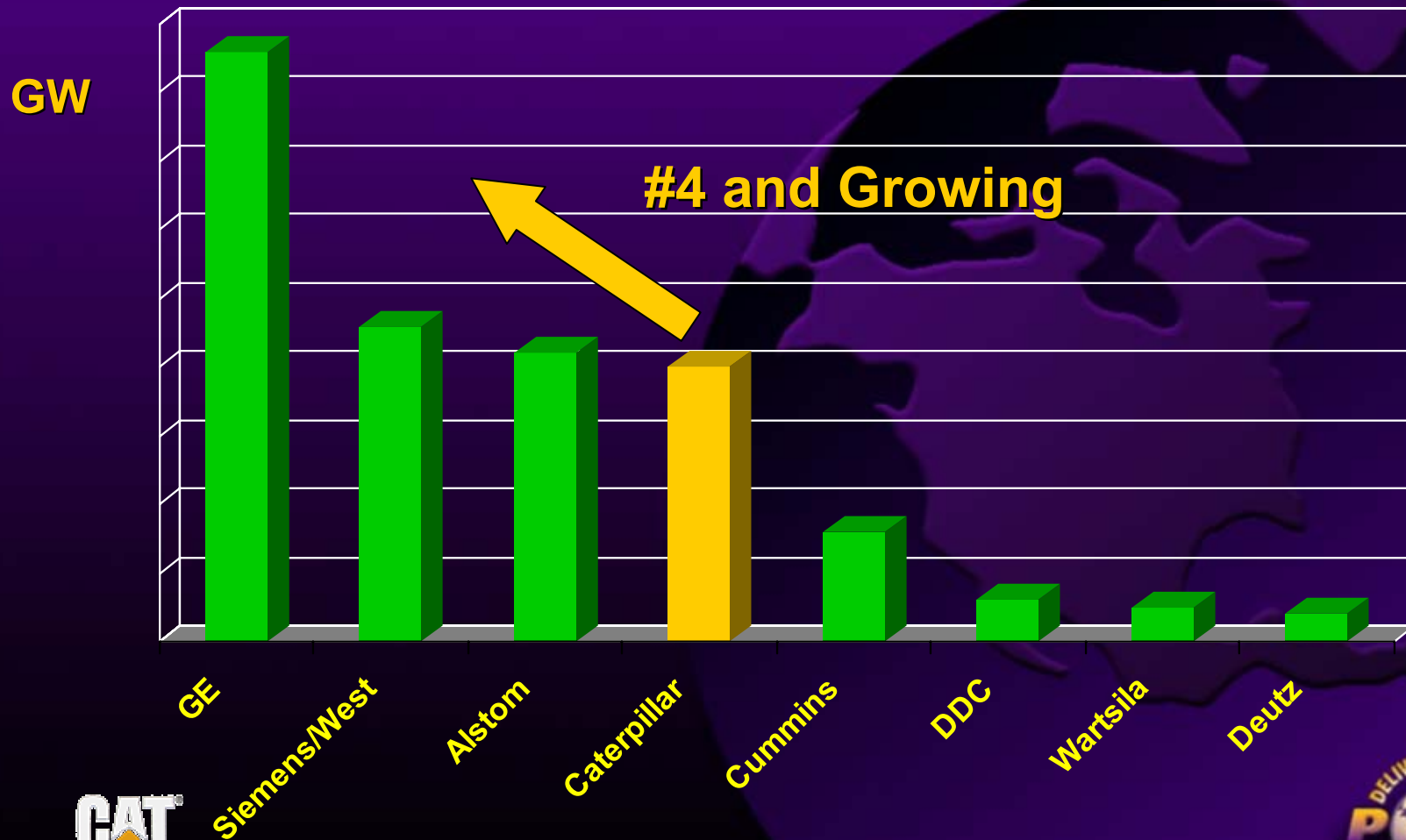
Background

- **Caterpillar Does Power????**
- **World's Largest Diesel Engine Genset Producer**
 - 8 GW Shipped Annually
 - Over \$1B in Sales
- **Complete Worldwide Dealer Coverage**
- **CAT[®] Rental Power**
 - 5000MWs in Network

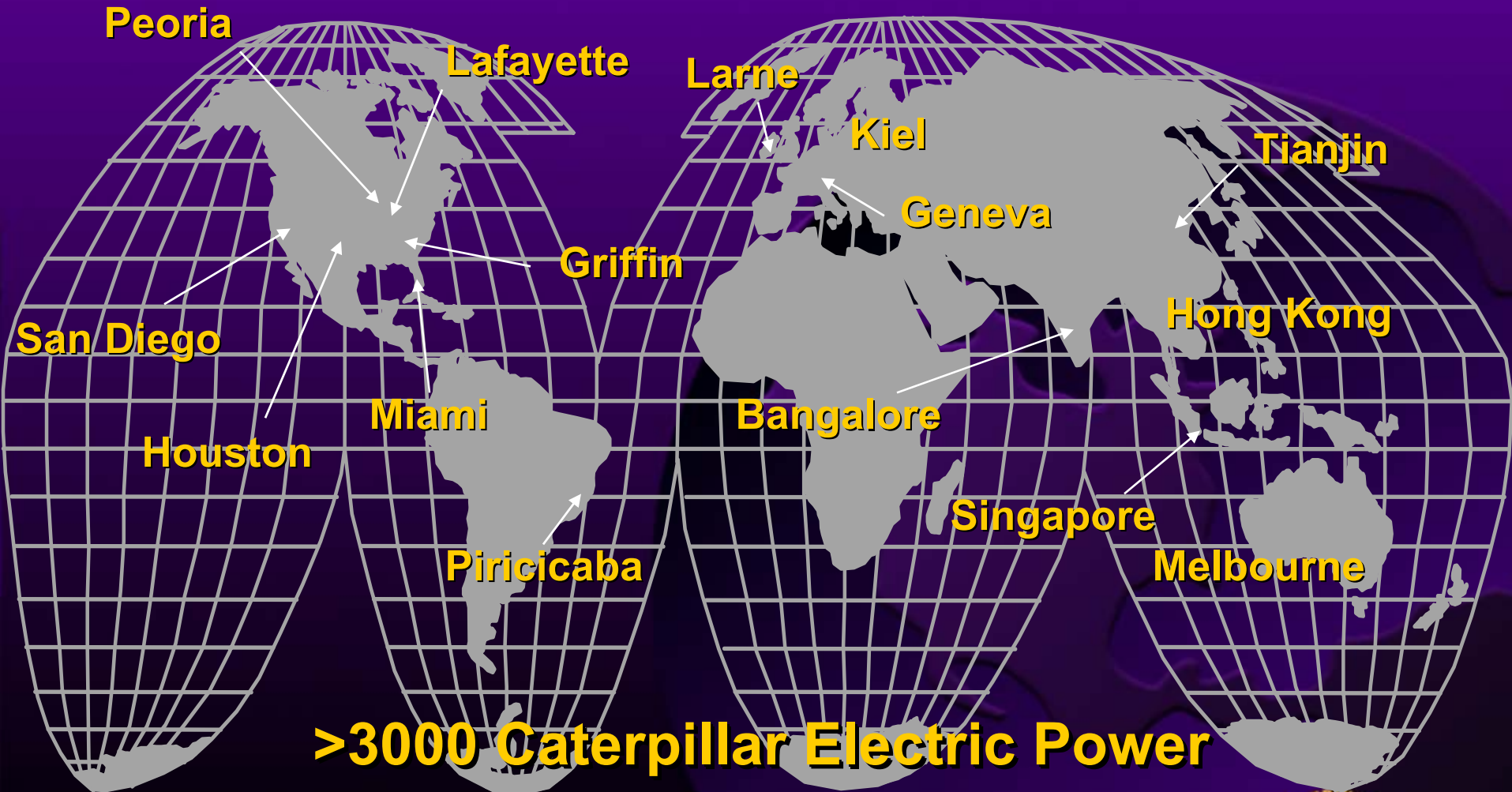


Background

Annual Installed Capacity



Background



**>3000 Caterpillar Electric Power
Dedicated Personnel**

Background

Dealer Locations



Available Technologies

- **What is it?**
 - **MW's on Wheels**
 - **Modular construction**
 - **Sized from 1MW to 22MW's**
 - **Projects range from 10-300MW's**
 - **Natural gas and diesel fuel**

Available Technologies

- **What does it look like?**
 - **Modular construction**
 - **Quick installations**
 - **Natural gas and diesel fuels**



XQ-2000 Power Module



XQ-5200 Gas Turbine

Available Technologies

- **What are the benefits?**
 - **Low cost capacity**
 - **Ease in installation**
 - **Power where you need it**
 - **Improves reliability**
 - **Substation relief and voltage support**

Available Technologies

- **What are the hurdles?**
 - **Space requirements**
 - **Electrical interconnection**
 - **NIMBY's**
 - **Permitting**
 - **Getting T&D to understand G**

Available Technologies

- **Why Temporary DG?**
 - **Special Events**
 - **Outage Restoration**
 - **Reliability Improvement**
 - **Peaking Power**
 - **Generation**

Case Studies

- **Special Events**
 - **Concerts**
 - **Conventions**
 - **Movie Sets**
 - **Golf Tournaments**
 - **Racing Events**
 - **Etc.**

Case Studies

- **World Youth Day - Toronto**
 - 800,000 People
 - 25MW of Prime/Standby Power
 - 75 Generator Sets
 - 666,500 ft. of Cable
 - 130 Transformers

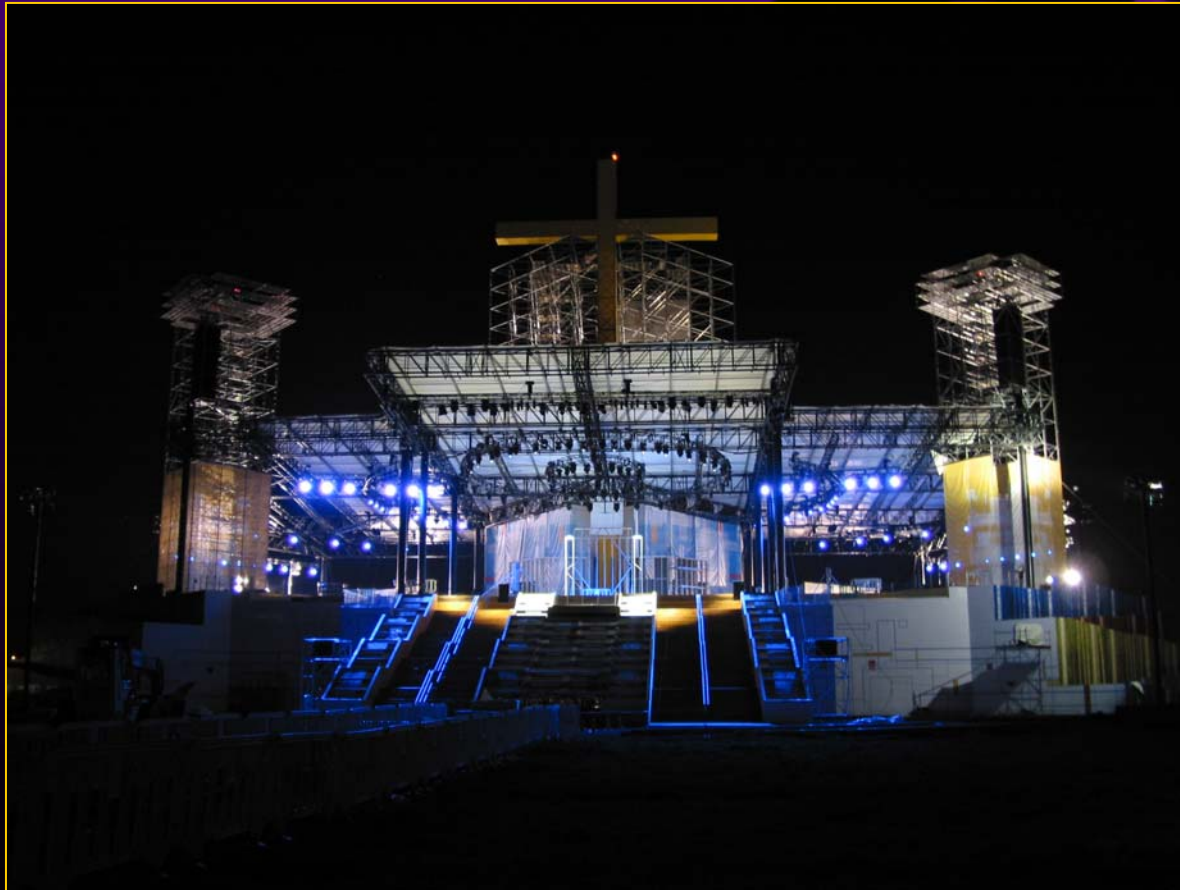
Case Studies

- **World Youth Day - Toronto**



Case Studies

- **World Youth Day - Toronto**

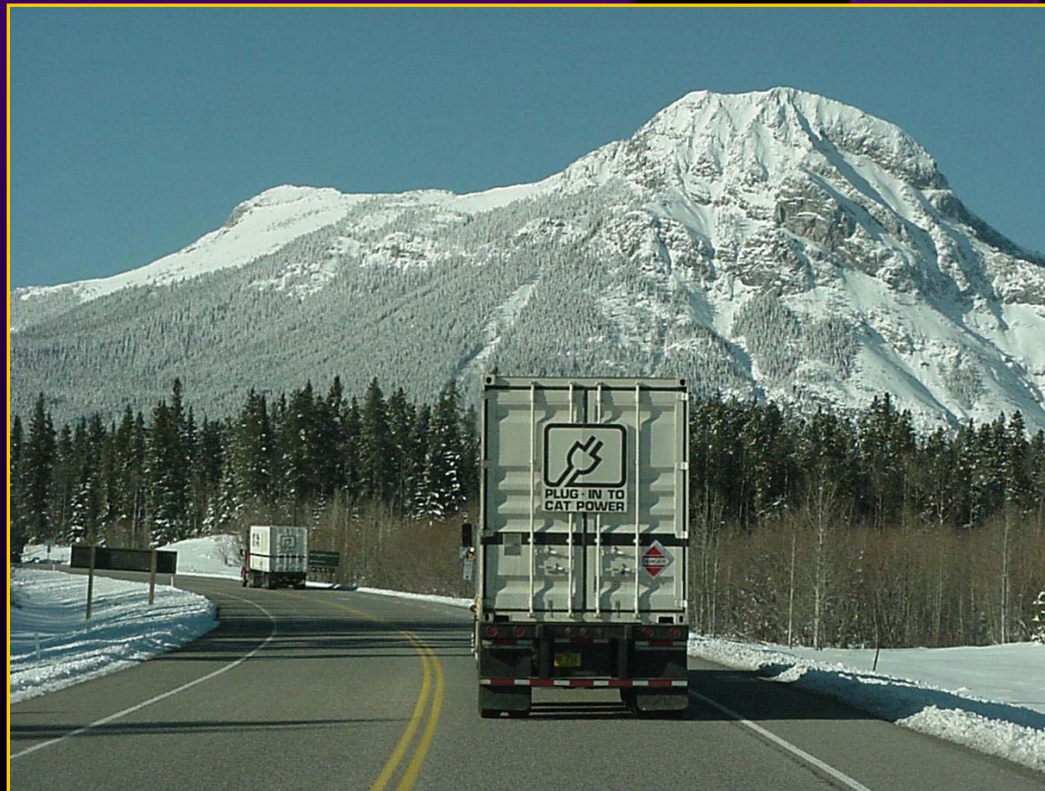


Case Studies

- **G8 Summit – Alberta**
 - Secluded Operation
 - 25,000 Support People
 - **EXTREMELY** Tight Security
 - 11MWs
 - 25 Generator Sets
 - N+ Redundancy

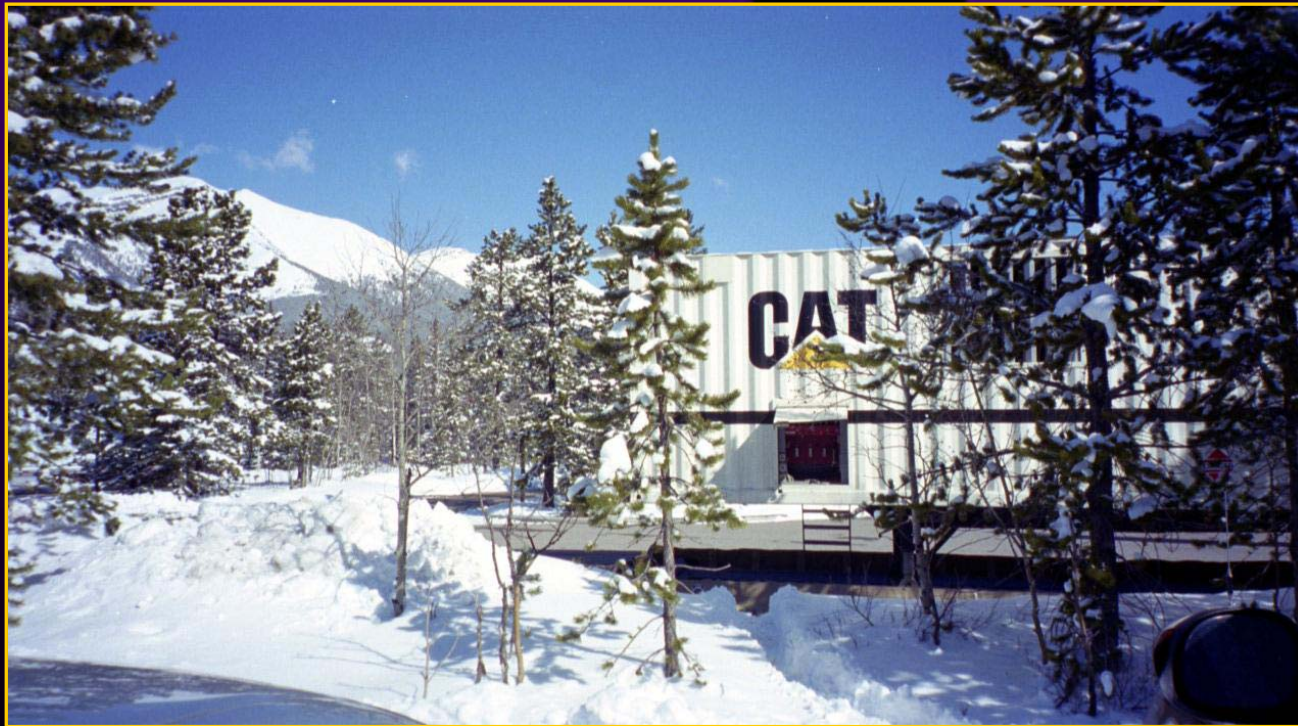
Case Studies

- **G8 Summit – Alberta**



Case Studies

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Case Studies

- **G8 Summit – Alberta**



Case Studies

- **Outage Restoration (planned and unplanned)**
 - **System Maintenance**
 - **Ice storms**
 - **Hurricanes - flooding**
 - **Equipment Failure**
 - **Disasters**

Case Studies

- **Outage Restoration (planned and unplanned)**
 - **Manhattan After 9/11**
 - **100+ MWs Installed in 4 Days!**
 - **Miles of 535MCM Cable**
 - **50% of Load was 208V**
 - **24/7 Operation**

Case Studies



Case Studies



Case Studies

- **Reliability**
 - **ComEd (Exelon)**
 - **3 Continuous Years**
 - **90 – 210 – 300MWs**
 - **10 Substations throughout Chicagoland**
 - **Summer Critical Operation**

Case Studies

- **Capable of delivering 100's of MW's**



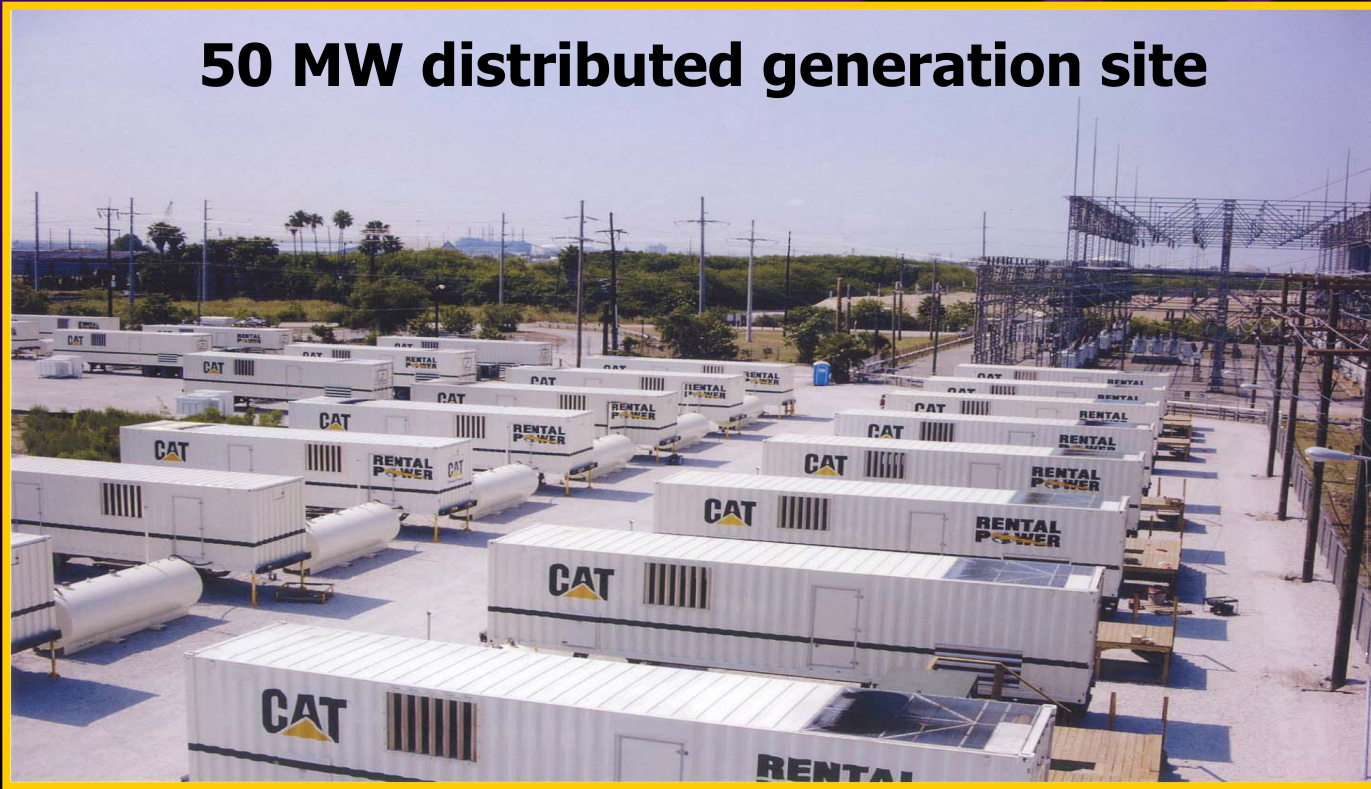
Case Studies

- **Peaking Power**
- **Stand alone generation site**
- **Turn key installation including:**
 - **Site preparation**
 - **Underground conduit installation**
 - **Overhead line installation**
 - **Equipment installation and testing**

Case Studies

- **Stand Alone Peaking Power Site**

50 MW distributed generation site



Case Studies

- **Communication Interface**



Case Studies

- **11MW Peaking Application in a Substation**
 - Limited Hours
 - Coincidental Peak Relief
 - Remote Operation



Case Studies



- **11MW Peaking Application in a Substation**
 - **Web Based Operations**

OmniMetrix Main - Microsoft Internet Explorer provided by Caterpillar Inc.

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Customer:

UNITS SHOWING FAULTS

Unit	Reports	At	Activity	Location
3PD808	No Meter Data	Oct 1 2002 3:41PM ET	Activity	

UNITS RUNNING

No units reported

INVENTORY

Unit Number	Unit Description	Current Status	Status Last Updated	Cumulative Run Time (hours)	Location
0051002062	roup	Status	Sep 26 2002 6:34PM ET	1448	
0041036912	PD803	Status	Sep 30 2002 1:24PM ET		
0041036914	PD804	Status	Oct 2 2002 10:49AM ET	0	
0041036916	PD806	Status	Sep 30 2002 3:17PM ET		
0041036918	PD807	Status	Oct 1 2002 5:56PM ET	0	
0041036920	PD808	Status	Oct 1 2002 3:41PM ET	2	

Case Studies



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Customer Login
Remote Control
Unit Listing
Status Page
Events Page
Meter Readings
Energy Data
Load Reduction Control

UNITS SHOWING FAULTS

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Case Studies



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Load Reduction Control



OmniMetrix Load Reduction Control System

Unit Name	Engine Run - Stop	Fault	Transfer Switch	Start Engine	Stop Engine	Generator Switch	Utility Switch	Rated kW	Producing kW	Produced KWH	YTD Savings, \$	Ser. No.	Last Update
Total								0	1024.512	440	220		
Group				Start	Stop	Generator	Utility	0				0051002062	Sep 26 2002 6:34PM ET
-BPD803				Start	Stop	Generator	Utility	0	1024	439	219.5	0041036912	Sep 30 2002 1:24PM ET
-BPD804				Start	Stop	Generator	Utility	0	0.13	0.25	0.125	0041036914	Oct 2 2002 10:49AM ET
-BPD808				Start	Stop	Generator	Utility	0	0.13	0.25	0.125	0041036920	Oct 1 2002 3:41PM ET
-BPD806				Start	Stop	Generator	Utility	0	0.13	0.25	0.125	0041036916	Sep 30 2002 3:17PM ET
-BPD807				Start	Stop	Generator	Utility	0	0.13	0.25	0.125	0041036918	Oct 1 2002 5:56PM ET

Case Studies

- **Stand alone generation sites**
 - 20 MW with mobile turbines on natural gas



Case Studies



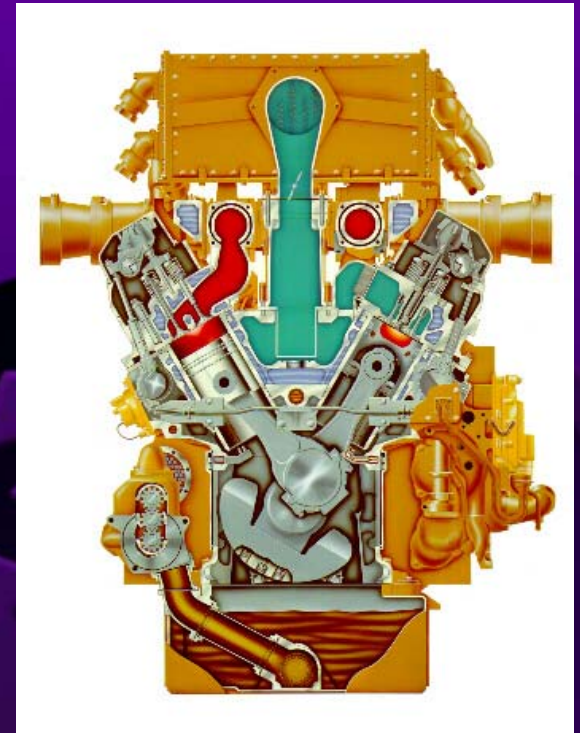
Case Studies

- **Stand alone generation sites**



Summary

- **Wide range of options**
- **Many segments served**
- **Economical and flexible**
- **Changing industry demands new solutions**





Thank You



fiorito_joseph_g@CAT.com
Phone 847-749-0797
WWW.CAT-RENTAL.COM

